AMENDMENTS TO THE CLAIMS:

Please amend Claims 1 and 22, cancel Claims 10 and 13, and add new Claims 26 and 27 as shown below. This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Currently amended)   A thermal control system for a spacecraft, the spacecraft being characterized in part by a spacecraft bus supporting at least one instrument tending to generate heat, and one or more spacecraft thermal radiator panels spatially separated and ~~mechanically~~ kinematically isolated from the at least one instrument, the system comprising:

        at least one active cooler mounted or for being mounted to the spacecraft at a location spatially separated and ~~mechanically~~ kinematically isolated from the at least one instrument[[,]]; and

        at least one kinematic mount for kinematically isolating the at least one active cooler from the at least one instrument,

        the at least one active cooler thermally coupled between the at least one instrument and the one or more spacecraft thermal radiator panels or for thermally coupling the at least one instrument and the one or more spacecraft thermal radiator panels,

        the at least one active cooler for transferring heat from the at least one instrument to the one or more spacecraft thermal radiator panels ~~without substantially transferring mechanical vibrations to the at least one instrument~~.

2.   (Previously presented)   The system as recited in claim 1, in which the at least one active cooler comprises a cryocooler.

3.   (Previously presented)   The system as recited in claim 2, wherein the cryocooler includes a compressor and cold head assembly mounted to a thermal radiator panel of the spacecraft.

4.   (Previously presented)   The system as recited in claim 3, including a thermal link, and in which the cryocooler assembly includes a thermal link coupled to an instrument FPA or other point requiring cryogenic cooling.

5.   (Original)   The system as recited in claim 4, in which the thermal link comprises a flexible high conductivity material.

6.   (Original)   The system as recited in claim 5, in which the thermal link is a high thermal conductivity braided material.

7.   (Previously presented)   The system as recited in claim 1, including a thermal link for thermally coupling the at least one active cooler to the at least one instrument, in which the thermal link is braided copper.

8.   (Original)   The system as recited in claim 4, in which the cryocooler assembly includes a working fluid tube passing through an opening in an earth platform of the spacecraft, for access to the instrument portion to be cooled.

9.   (Previously presented)   The system as recited in claim 1, in which the at least one active cooler is one among a bank of multiple active coolers.

10.   (Canceled)

11.   (Previously presented)   The system as recited in claim 1, including a closed loop control system configured to measure temperature of the at least one instrument, receive a prescribed set temperature, and in response supply a control signal to the at least one active cooler.

12.   (Previously presented)   The system as recited in claim 1, in which the at least one active cooler is thermally coupled to any one or more of a north, south, east, west or earth panel of the spacecraft.

13.   (Canceled)

14.   (Original)   The system as recited in claim 4, in which at least one cryocooler is a multiple stage cryocooler, and multiple links emanate from the cryocooler.

15.   (Original)   The system as recited in claim 1, in which the spacecraft includes two solar array wings extending therefrom.

16-20. (Canceled)

21. (Previously presented) The system as recited in claim 1, further comprising:

a closed loop control system;

a plurality of active coolers including the at least one active cooler; and

a plurality of instruments including the at least one instrument,

wherein the closed loop control system is for generating cooler drive signals D as follows:

$$T_e = T_f - T_c$$
$$\Delta d = -R^T (R\ R^T)^{-1} T_e$$
$$D = d_0 + \Delta d$$

where T_e is a temperature error, T_f is a temperature command, T_c is a measured temperature signal, R is an NxM matrix of partial derivatives related to changes in cooler drive signals to changes in temperatures of the plurality of instruments, N is the number of the plurality of instruments, M is the number of the plurality of active coolers, and d_0 is a nominal cooler drive set point.

22. (Currently amended) A system comprising:

an instrument platform;

at least one instrument mounted on the instrument platform, the at least one instrument tending to generate heat;

at least one thermal radiator mounted at a location spatially separated and ~~mechanically~~ kinematically isolated from the at least one instrument;

at least one active cooler mounted at a location spatially separated and ~~mechanically~~ kinematically isolated from the at least one instrument;

a thermal link thermally coupled between the at least one active cooler and the at least one instrument[[,]]; and

at least one kinematic mount for kinematically isolating the at least one active cooler from the at least one instrument,

wherein the at least one active cooler is for transferring heat from the at least one instrument to the at least one thermal radiator ~~without substantially transferring mechanical vibrations to the at least one instrument~~.

23. (Previously presented) The system as recited in claim 22, wherein the thermal link is braided copper.

24. (Previously presented) The system as recited in claim 23, further comprising:

a second active cooler,

a second thermal link coupled between the second active cooler and the at least one instrument,

wherein the second thermal link is braided copper.

25. (Previously presented) The system as recited in claim 22, wherein the system is a spacecraft, the system further comprising:

two solar array wings;

a first spacecraft panel;

a second spacecraft panel;

a second thermal radiator;

a second active cooler mounted on the second spacecraft panel,

wherein the second spacecraft panel is the second thermal radiator,

wherein the first spacecraft panel is the at least one thermal radiator,

wherein the at least one active cooler is mounted on the first spacecraft panel,

wherein having the at least one active cooler and the second active cooler mounted on the first and second spacecraft panels, respectively, eliminates a need to perform a yaw flip of the spacecraft required to prevent radiator sun exposure,

wherein the two solar array wings minimize a solar pressure torque, minimize a need for frequent momentum-adjust maneuvers, and minimize a need to carry a large amount of momentum-adjust propellant.

26. (New) A thermal control system for a spacecraft, the system comprising:

a closed loop control system;

a plurality of active coolers; and

a plurality of instruments,

wherein the closed loop control system is for generating cooler drive signals D as follows:

$$T_e = T_f - T_c$$
$$\Delta d = -R^T (R R^T)^{-1} T_e$$
$$D = d_0 + \Delta d$$

where T_e is a temperature error, T_f is a temperature command, T_c is a measured temperature signal, R is an NxM matrix of partial derivatives related to changes in cooler drive signals to changes in temperatures of the plurality of instruments, N is the number of the plurality of instruments, M is the number of the plurality of active coolers, and d_0 is a nominal cooler drive set point.

27.   (New) The system as recited in claim 26, wherein the plurality of instruments includes at least one instrument,

wherein the plurality of active coolers includes at least one active cooler mounted to the spacecraft at a location spatially separated from the at least one instrument.